

increased yields in the harvests would never be noticed by the country. To improve existing conditions, the Mukalla Government could buy good seed from outside and sell it to cultivators. Many of the crops are merely deteriorating year by year owing to the non-introduction of fresh seed. 000

"The district I traversed could never be made an agricultural one owing to the lack of soil. I was informed that nearly all the grain consumed in the country comes from India, etc., and this state of affairs will, I fear, always be the case. Perhaps the agriculture in the Hadhramaut may be better—one hears so—but as far as Europe is concerned, Mukalla may, from an agricultural point of view, be considered as non-existent."

GEOLOGICAL REPORT.

Mr. O. H. Little reported that within the area he visited, lignite deposits varying in thickness between 15 inches and 5 feet exist at Kasai, Asfal Al 'Ain and Ad Da'liya. Samples of lignite were also brought from Lumeisa, about 20 miles north-west of Wadi Yuwan, and similar seams were reported to exist at Jebal Ruba and Tramwa, beyond Lumeisa. Samples were also obtained from the Wadi Howeri, at a point about 80 miles north of Mukalla, and at Khardarani, Jebal Ar Reish. He proved the seams at Kasai and Asfal Al 'Ain to extend for 150 yards along the cliff face and, though they both showed a decreasing thickness away from the main workings, he considered this was possibly due to the small amount of clearing. While the deposits are probably lenticular, much more work would have to be done before this is proved or their extent estimated. In *Southern Arabia* Bent describes the cliffs in a wadi near the Hadhramaut in terms which leave no doubt as to their similarity to the cliffs in which lignite has been found. Though he does not mention the occurrence of lignite, possibly because its existence in the country was then unknown, the probable extension of the coal-measures to a distance over a hundred miles north of Mukalla makes it possible that lignite deposits would be found throughout a very much greater area than in the 1,000 square miles of the coal-measure mapped. Little states that when the Beduins near Mukalla learnt the value of lignite and where to look for it on the scarps, they were reporting every outcrop of dark shale they found. A deposit at Ad Da'liya was discovered in this way only a short time before his arrival in Mukalla. He noticed many places in the scarps where they had evidently dug without success, but as they rarely dug more than a couple of feet deep they often failed to penetrate the debris. The almost inaccessible positions in which the lignite is found, and the fact that digging is necessary, would make systematic search for it expensive, but he considered that by offering suitable rewards the inhabitants would undoubtedly be induced to devote time to searching the scarps in their own districts. The coal-measure shales weather so easily that outcrops of lignite are soon covered by material from above, and fragments

135 of lignite in the detritus on the slopes and in the wadis are very rare; this he considered to be probably due to the very heavy rains which fall in the mountains every few years, which produce such floods that enormous rocks are moved along the wadi beds.

464 Mr. Little stated that the difficulties of working the deposits had
312 been pointed out by Mr. Beeby-Thompson and Dr. Ball (who
135 visited Mukalla in 1918). They thought that cheap unskilled labour could be produced locally, but for working on a large scale Mr. Little expressed the opinion that the local supply would prove unreliable and that labour would have to be imported. On the other hand, Messrs. Beeby-Thompson and Ball were not aware that a river (the water of which is slightly saline) flows through the oil-shale district near Neifa. Above Neifa the water is potable when boiled, but below Neifa it is very tainted by the petroliferous deposits through which it passes. Supplies of water might also be obtained by conserving the flood-water which flows down the wadis from the interior. There is generally a small flood every rainy season, with bigger floods every few years.

135 The heat of the sun in summer in the Hadhramaut is so great that rocks near the surface must lose most of their volatile constituents, and, to get a true indication of the amount of these it is necessary to take samples from a greater depth than has been done hitherto. The improvement which may take place with increasing depth is shown by the results of the analysis of two samples from Asfal Al 'Ain. The first was collected from different parts of the face of the seam which had been exposed for over a month, and the second was obtained by driving a hole 5 feet into the seam and taking it from the last portion removed. The calorific value of the latter sample, from Asfal Al 'Ain being 11,466 B.T.U.s. and of those from Kasai and Wadi Howeri over 10,000 B.T.U.s., show that in a country where fuel supplies are very scanty the lignite deposits would prove an important source of fuel. The oil-shales probably extend to south-west much beyond the area visited and mapped, and if at some distance below the surface they are richer than the sample brought by Messrs. Beeby-Thompson and Ball, they could be distilled near the river. In the economic exploitation of the fuel resources of the Sultanate, the possibility of finding oil fuel in the As Sidara district should be considered, as if oil exists there the pipe-line could be brought down the river to Wadi Arus and Neifa and thence to the coast. The river at Wadi Arus is 15 miles and at Neifa 10 miles in a straight line from the lignite deposits at Ad Da'liya, from which the fuel for the distillation of the oil-shales might be obtained. The danger of pipe-lines and railways being swept away by the big floods which occur every few years would have to be borne in mind when laying them. There is an anchorage for dhows at Mersa Riqeima just east of the river mouth, which Mr. Little thought might be suitable for small steamers except during the monsoon period.

- 135 Government; 'Arūdh al Makhāshin' belonging to the Makhāshin section of the Nahd, with a population of 300, all subjects of the Qu'aiti Government; An Naq'a belonging to the Bā Wazīr townsmen with a population of 500; Al 'Ajlānia, belonging to the Āl Kathīr with 17 armed men; Al Man'at, belonging to the Nahd with 35 armed men; and Al Marāti, a village between Al Man'at and Henin, with 200 armed tribesmen of Kinda, and 50 of the Nahd.

At Al 'Ajlānia between Henin and Al Qatn are the houses of the Bā 'Umar Sheikhs with 15 armed men; the town of Mad-har bin Nahd in the Wadi Manūb with 500 armed men of the Nahd and Āl Shabīb (a section of the Nahd), and Dīār al Maqārīm with 90 armed Nahd tribesmen.

Between Al Qatn and Shibam are: 'Ardh Masrūr belonging to the Āl ash Sheikh 'Ali Āl 'Ali bin Ahmed (Yafa'is) with 60 armed men; Huweila belonging to the Āl ash Sheikh 'Ali Āl Salim bin 'Ali (Yafa'is) with 40 armed men; Khashāmīr belonging to the Bin 'Ali Jābir (of the Mausata clan of Hadhrami Yafa'is) with 80 armed men; Al 'Iqad, situated at the end of Al Qatn and the beginning of Wadi Beni Rashīd, belonging to the Āl Qu'ata (of the Mausata clan of Hadhrami Yafa'is) with 75 armed men; 'Ikāba and Al Husn belonging to the Hamdhān (of the Nahd) with 30 armed men; Husūn at Al Qatn belonging to the Āl az Zu' (of the Nahd) with 40 armed men; Husūn belonging to the Bal'alā (Hadhrami Yafa'is) with 30 armed men; and Husūn belonging to the Āl Jābri (Hadhrami Yafa'is) with 25 armed men.

- 438 Shibam is the most important advanced market of the Hādhramaut, and has a large inward traffic from Mukalla. It is also a
361 buying market for the products of the country north and west, and the products of these parts are consumed in the town. Caravans come from San'ā in about 15 days. The tribesmen bringing these caravans are Āl 'Aqīl, Āl Rabi', Āl Khalifa, and 'Abīda. The principal inland traffic, however, is from Merkha, Hadhina, Joba, Beihan, and Harib. These caravans, mainly carrying maize, wheat, barley, ghee, oil, oilcakes, cotton, honey, blankets, and spinning cloth, are brought by 'Aulaqis, Hamām, Āl Ruba'la, Āl 'Aqīl, Āl Maradi'a, Āl Khalifa, Dohum, Karab, Nahd and Āl Bureik tribesmen.

- 361 There is no regular communication with Nejd although occasional visitors come skirting the desert. Members of the Rashidi tribe also come to Shibam now and then. There is a landing ground at Shibam, and apart from its being a large caravan station it is in touch with towns between Hajarein and Qasm by car. It has no great industries, but makes mats and dyes cloths and skins.

- 135 The Governor of the Shibam province is Feraī Sa'id, a slave who has held high positions and who has previously served at
361 Shibam. He has also been Governor of 'Einat. He was appointed in October 1934, in succession to Sultan 'Ali bin Salah al Qu'aiti.

172



FIG. 17—Ruins of a pre-Islamic city in the Wadi Masella. The site was chosen for defensive purposes and each house was in itself a fortress.

HOT SPRINGS

133

[135]

Hot sulphurous springs are widely scattered in the coastal zone, and fairly accurate accounts of many of them are available. They commonly deposit gypsum in quantity. Some of the deposits are so large as to suggest either that activity was more general in the past or that the position of the spring outlets has shifted. The springs may be attributed to the same subterranean conditions that prevail in Yellowstone Park, where descending waters become superheated through close association with uncooled rocks and rise again to the surface.

312

241

361

[271]

Within half a mile of the coast of Hami, east of Mukalla, several hot springs are utilized by the natives for irrigation of date palms and millet and also for drinking. Neither here nor elsewhere does the



[312]

FIG. 18—A view in the Wadi Masella where water is present during most of the year. The edge of the fal appears in the background.

MI Middle East

LITTLE

ADEN MM1
HADHRAMAUT MM2
is known of the mineral reserves of this N
region, and most of the local industries are 135
small and primitive. Salt is the chief export 438
of the Colony; tobacco, honey and fish A
products, of the Protectorates. 439

The port of Aden is visited regularly by A
ships from all parts of the world. Within 514
the last few years, the Colony has also be- 509
come a regional center for air services to
Cairo and other cities in the Near East
and East Africa. Communications between A
the Colony and the interior are mainly by 441
roads and caravan trails, supplemented by 442
a coastwise dhow trade. Camels and don-
keys are the primary means of transport,
but the use of motor vehicles is increasing
along the main routes. Roads suitable for H
motor traffic link Aden Colony with certain A
population centers in Western Aden Pro- 441
tectorate, and Mukalla with the larger
towns of the Hadhramaut and adjacent H
coastlands. Access to the interior is also [504]

FOOD AND NUTRITION

Aden Colony is a cosmopolitan com- A
munity, in which a variety of food habits 262
is found among the peoples of different 439
racial and economic groups. With the excep- 146
tion of fish, milk and limited supplies of 464
garden vegetables, all foodstuffs are im-
ported. Undernutrition is prevalent among
the poorer inhabitants, and particularly
among the transient laborers from the
interior.

Food supplies are never abundant in the H
Protectorate, where cultivation is restricted 511
by the nature of the terrain and the scarcity 433
of water in many areas. Anything which 731
interferes with normal production, such as
droughts or an invasion of locusts, may
result in local food shortages, often ap-
proaching famine conditions. The Hadhra-
maut was seriously affected during the
widespread drought in 1943, and children
were evacuated from some of the famine
areas to relief camps in Mukalla.

The average Arab diet is simple, while H
that of the pastoral tribes is almost invari- 262

M1 Middle East

1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952
1953
1954

Plants. The shrub, *Catha edulis*, colloquially known as qat, is extensively cultivated in sections of the western highlands. The leaves yield a stimulant which dissipates fatigue and causes loss of appetite and of desire for sleep. Qat chewing is a popular custom in the Colony and Western Aden Protectorate, as it is in Yemen.

Cases of poisoning, caused by the contamination of imported wheat with grains of *Lolium temulentum* (Darnel grass), are recorded frequently. Species of *Euphorbia* grow in many areas, and contact poisoning is sometimes observed.

FOOD SANITATION

Regulations governing the sanitary quality of milk, meats and other products are in force only in the Colony. The markets and the slaughterhouses, which are located at four points—in Crater, Tawahi and Maala, on the peninsula, and in Sheikh Othman—are operated under the supervision of sanitary inspectors. Eating houses, coffee shops, date stalls and other premises where foods are prepared or sold, and the aerated water and ice factories, are licensed and inspected from time to time. No controls are exercised over food handlers, however, and many food vendors and workers in small shops are immigrants among whom the standards of cleanliness are generally poor.

Meat animals are inspected by veterinary officers at the slaughterhouses, but no post-mortem examinations of the carcasses are made. The dairy cows are housed in municipal or private sheds within the town limits. Samples of milk from commercial herds are collected at regular intervals and tested for adulteration. There are no facilities for pasteurization. Opportunities for the spread of infection through contaminated milk are minimal, however, due to the universal custom of boiling milk before it is used. Brucellosis is enzootic among the goats, and infections undoubtedly are transmitted to man occasionally through cheese and other milk products. Bovine tuberculosis is pres-